

9149 ✓

SHEET 1.

Fig. 1.

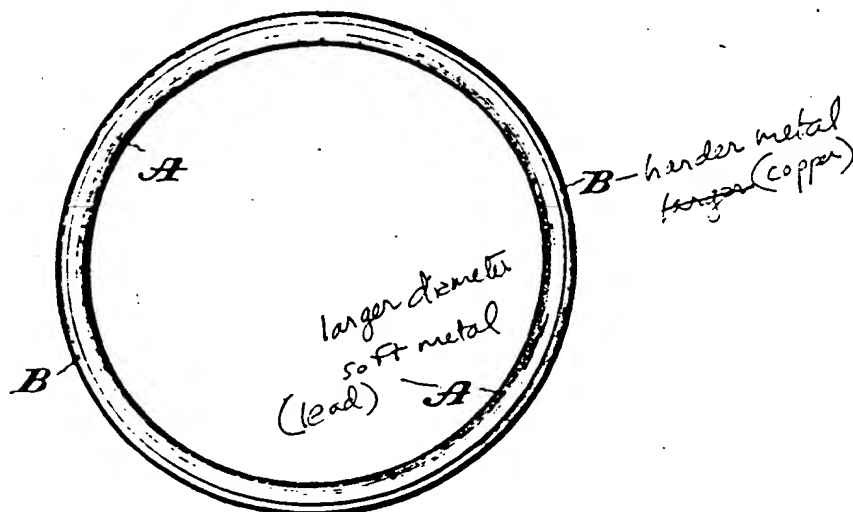


Fig. 2.

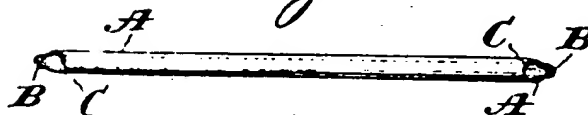


Fig. 3.

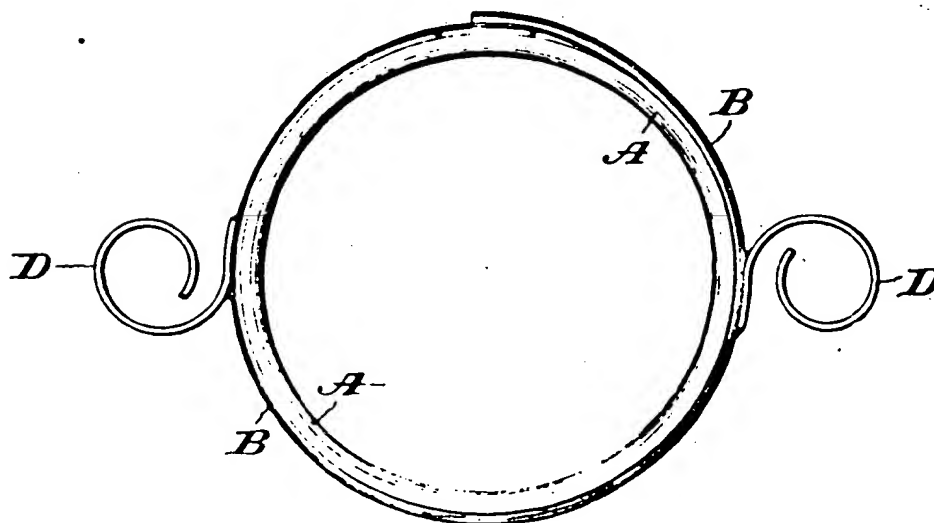
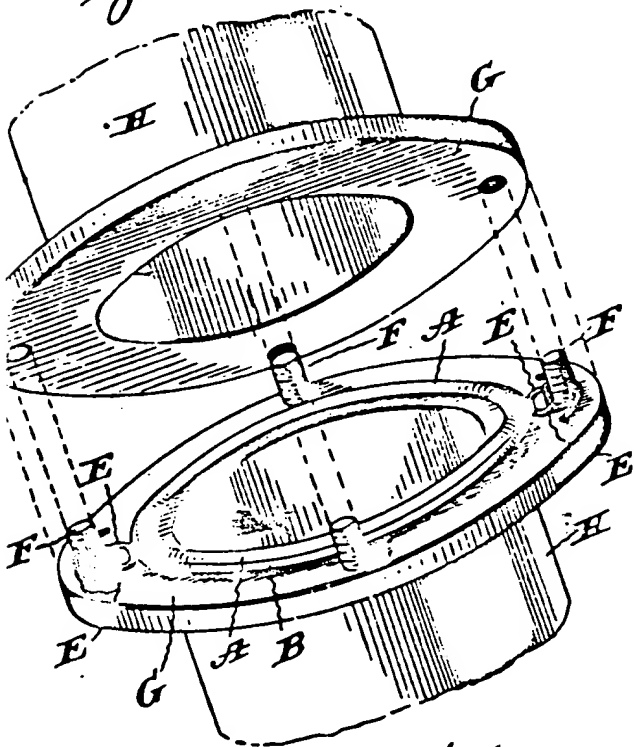


Fig. 4.



[This drawing is a reproduction of the Original on a reduced scale]

Fig. 5.

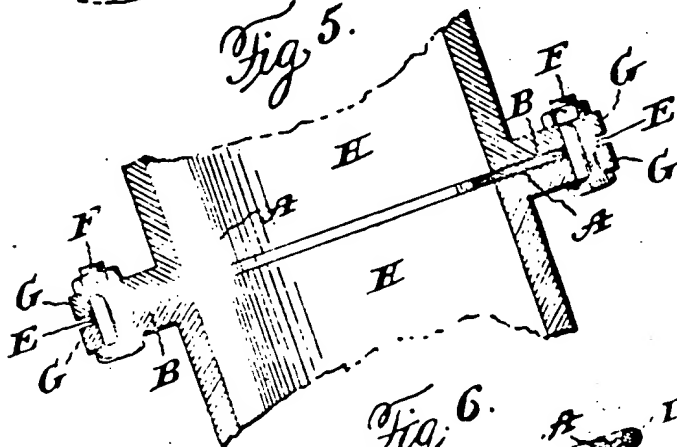
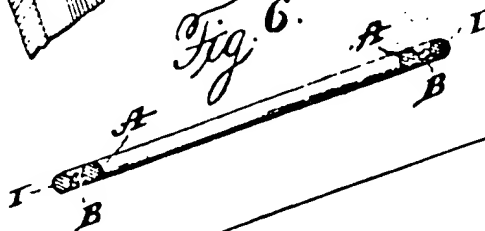


Fig. 6.



N<sup>o</sup> 9149



A.D. 1900

*Date of Application, 17th May, 1900—Accepted, 7th July, 1900*

COMPLETE SPECIFICATION.

**Improvements in Gaskets or Packing for the Joints of Pipes or other Apparatus.**

We, CHARLES HOWARD MERWARTH, of North West corner Third and Elm Streets, South Bethlehem, in the County of Northampton and State of Pennsylvania, United States of America, and FREDERICK CONLIN, of No. 355, Market Street, Bethlehem, in the County, State and country aforesaid Manufacturers, do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

- Figure 1 is a plan view of a gasket embodying our invention;  
Figure 2 is a sectional view of the gasket shown in Figure 1;  
10 Figure 3 is a plan view of another embodiment of our invention;  
Figure 4 is a perspective view of a pipe joint having applied thereto another embodiment of our invention, and  
Figure 5 is a sectional view of the construction shown in Figure 4;  
Figure 6 is a like view of another embodiment of our invention.

- 15 Letters of like name and kind refer to like parts in each of the figures.

The object of our invention has been to provide a gasket or packing for joints of pipes and other apparatus for containing or conveying fluids or liquids, such as steam, oil, gas, and the like, whether under pressure or not, which gasket will have the qualities of being easily applied and without undue tightening of  
20 the joint, of forming a perfect seal thereof: of being easily removable therefrom, and of having a low cost: and to such ends our invention consists in the gasket or packing hereinafter specified.

In carrying our invention into practice we employ, as shown in Figures 1 and 2, an inner ring A and an outer ring B. The rings A and B are preferably  
25 formed of wire, which, as shown, is substantially circular in cross-section, but which may be polygonal, or of any other form of cross section, the inner one A being formed of a soft metal, such as lead, and being preferably of larger wire than the outer ring B.

The outer ring B is composed of a harder metal than the inner one, preferably  
30 of copper, and is preferably formed from wire of a smaller size than the inner ring. Each ring is preferably made continuous with the ends of the wire abutting rather than overlapping, an electric weld being found to be very effective in forming a perfect joint between the ends of the wire and one that is uniform in size with the wire. The outer ring B may, however, have its  
35 ends lapped over each other and fastened in any desired manner. The inner ring may also be formed by overlapping the ends of the wire, but it is preferable to form a butt-joint. Instead of using wire, we contemplate using washers, which may be cast or may be stamped or otherwise formed from sheet metal.

The rings A and B are preferably fastened together, although they can be left  
40 loose from each other and assembled in their proper relation at the time of applying them to the joint. We preferably form a groove C in the outer periphery of the inner ring A, such groove being adapted to receive and fit over the

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wire of the outer ring B and thus to hold the two rings together. The groove can, if desired, be formed in the outer ring B, instead of, as shown, in the inner ring. The groove C may alone be depended upon to hold the two rings together, or in addition thereto, solder may be used, or we can omit the groove and use solder alone. We can form the groove in the ring after it is complete 5 and before putting the rings together: it can be formed in drawing the wire of which said ring is formed, or we can use round wire, and, after forming the rings and putting them together by suitable tools throw out the metal of the ring A against the wire of the ring B on each side of their line of contact so as to form the groove C. 10

The operation of our gasket is as follows:

The gasket which is of a diameter slightly greater than the interior diameter of the pipe to which it is to be applied is placed between the ends of the pipe, and the latter are drawn together by the bolts or other means which are provided for that purpose. The ends first bear upon the inner, or soft ring A and 15 compress it, causing it to take the impressions of the surfaces of the ends, which surfaces are usually rough, and to fill up all inequalities in such surfaces where they bear on the said rings. The ends then flatten the metal of the inner ring until they bear upon the outer or harder ring B. The latter ring has sufficient strength to resist all 20 but a slight flattening of the convex surfaces, and thus causes the ends to become parallel, if they are not already so, and to bear equally on all parts of the soft ring. The outer ring also sustains the soft ring against the pressure of the fluid or gas in the pipe and prevents its being blown out at any point and thus causing a leak. The outer ring being practically incompressible at all pres- 25 sures necessary to properly compress the inner ring, prevents such pressure on said inner ring as would destroy its continuity or otherwise injure it. Our gasket being made entirely of metal does not adhere to the pipe ends, as does gutta percha or fabric, and, when removed, leaves a clean surface.

We regard our invention as covering broadly, any gasket or other packing 30 having a soft metal portion which is adapted to be compressed against the surface to be packed and having an outer portion of harder metal which sustains the soft metal portion against internal pressure, against undue pressure of the flange, or against both of such pressures. Such a construction can take the form of a portion of harder metal having a groove in its surface, in which groove 35 is sustained a portion of softer metal. Our inner and outer rings can be made of the same thickness, in a direction that is perpendicular to the plane of the gasket, or, as we prefer, the inner ring can be made thicker. It is, of course, to be understood that our gasket is to be made circular, square, oval, or of other outline to adapt it to the opening it is to fit, and that for some purposes it 40 is not necessary to give the outline of the gasket the form of a closed figure, but that a straight or curved length formed of the harder metal on the outer side and softer metal on the inner side, can be used.

It is desirable in gaskets for many forms of joints to have some centering means to ensure that the gasket shall retain its proper place while the joint is 45 being tightened. In the embodiment of our invention shown in Figure 3, we secure to the outer ring, preferably by soldering, spiral coils D and D' of wire, such coils being positioned with reference to the bolts which fasten the pipe flanges together so that the free ends of the coils can engage the bolts and hold the gasket centrally on the flange. The spiral coils, preferably have some 50 spring, so that they can adapt themselves to bolts at different distances apart, or they may be formed of wire which can be bent to further extend the range of adaptability.

In Figures 4 and 5 is shown an embodiment of our invention in which centering means are provided in the form of pairs of wires E and E', which are united 55 to the outer ring B, preferably by soldering, the wires being shown as being the free ends of a wire that is soldered at its middle to the ring B. The wires E

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and E are preferably flexible, and are conveniently crossed to form a half knot, or knot, and then passed on opposite sides of the bolts F and F, which unite the flanges G and G of the pipe ends H and H that are to be coupled, the free ends of the wires being then wrapped around the said bolts, or being crossed or tied.

- 5 The half knots in the centering wires bear against the inner sides of the flange bolts and center the gasket, while the crossing or tying of such wires outside the bolts, serves to fasten the gasket in place.

In use with man-holes and like constructions, where the fluid pressure is toward the center of the gasket, we place the soft metal ring outside, instead of  
10 inside of the hard metal ring, the object being in all cases to have the soft metal ring toward the fluid pressure and the hard metal ring on the side of the soft metal ring opposite to the fluid pressure, so that the soft metal is supported against the fluid pressure by the hard metal.

In Figure 6 we have shown a gasket which comprises a thick inner soft-  
15 metal ring A, an intermediate, thin, hard metal ring B, outside of the ring A, and a thick, outer, soft metal ring I. When used in a flanged joint, or a socketed joint, the outer ring I serves as a centering ring for the gasket, while also, to some extent, serving as a packing ring. When the gasket is used in  
20 packing a man-hole, the inner ring A may serve as a centering means.

- Our gasket being composed of non-corrosive metals, does not deteriorate with age. Although we use soft metals in our gasket, their melting points are well above the temperature of steam at all ordinary pressures.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what  
25 we claim is:—

1. A packing for steam and other joints comprising a portion of soft metal that is adapted to be compressed against the surface to be packed, and a portion of harder metal that supports the softer metal against the fluid pressure, substantially as described.
- 30 2. A packing for steam and other joints comprising a portion of soft metal that is adapted to be compressed against the surface to be packed, and a portion of harder metal that protects the soft metal against undue pressure from such surface, substantially as described.
3. A packing for steam and other joints comprising a portion of soft metal  
35 that is adapted to be compressed against the surface to be packed, and a portion of harder metal that preserves the soft metal both from undue pressure from such surface and from injury from the fluid pressure substantially as described.
4. A packing for steam and other joints comprising a portion of soft metal that is adapted to be compressed against the surface to be packed, and a portion  
40 of harder metal outside of and supporting said soft metal, the soft metal being unconfined on its inner side, substantially as described.
5. A packing for steam and other joints comprising an inner ring and an outer ring, the inner ring being of soft metal and the outer ring being of harder metal, substantially as described.
- 45 6. A packing for steam and other joints comprising an inner ring and an outer ring, the inner ring being of soft metal, the outer ring being of harder metal, and the inner ring having greater thickness than the outer ring, substantially as described.
7. A packing for steam and other joints comprising an inner ring of soft metal  
50 and an outer ring of harder metal, one of such rings having a groove in which the other of said rings is received, substantially as described.
8. A packing for steam and other joints comprising an inner ring of soft metal and an outer ring of harder metal, said outer ring being uniform in cross section and homogeneous throughout its entire extent, substantially as described.
- 55 9. A packing for steam and other joints consisting of a gasket, and centering means comprising wires having a thickness not greater than the thickness of

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the gasket, said wires being attached to the outer periphery of the gasket, substantially as described.

10. A packing for steam and other joints, comprising a gasket, and centering means comprising pairs of flexible wires having a thickness not greater than the thickness of the gasket, said wires being attached to the outer periphery of the gasket, substantially as described. 5

Dated this 17th day of May 1900.

JENSEN & SON,  
77, Chancery Lane, London, W.C.,  
Patent Agents.

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